



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,092	12/01/2006	Nello Nigro	9378/206 (IP 23567)	9789
757 7590 02/11/2008 BRINKS HOFER GILSON & LIONE P.O. BOX 10395 CHICAGO, IL 60610				
EXAMINER SUNG, GERALD LUTHER				
ART UNIT 4156		PAPER NUMBER		
MAIL DATE 02/11/2008		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/574,092

**Applicant(s)**

NIGRO, NELLO

**Examiner**

GERALD L. SUNG

**Art Unit**

4156

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/29/2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 8/8/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "storage region" and the "steam turbine" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The means for supplying coal bed methane, oxygen from the air separation plant, air from the air compressor, and flue gas to the combustor are not clearly set forth in the specification. The means for supplying flue gas from the heat recovery steam generator (HRSG) to the combustor is not clearly set forth in the specification. The means for supplying air from the air compressor to the air separation plant is not clearly set forth in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 13 and 15 are indefinite because of the following reasons: The means for supplying coal bed methane, oxygen from the air separation plant, air from the air compressor, and flue gas to the combustor are not clearly set forth in the specification. The means for supplying flue gas from the heat recovery steam generator (HRSG) to the combustor is not clearly set forth in the specification. The means for supplying air from the air compressor to the air separation plant is not clearly set forth in the specification.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

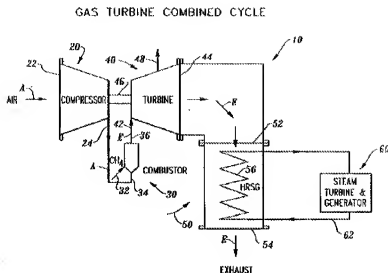
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Viteri et al. USPN .6,622,470 B2 in view of Ooka et al. CA 2,465,384.

9. Regarding claim 1, referring to figure 1 below, Viteri et al. disclose a combined cycle power plant where in the operation of the disclosed power plant would have yielded the method of supplying methane and air to a combustor to drive a gas turbine, supplying the hot flue gas to a heat recovery steam generator to create and providing steam to drive a steam turbine. Referring to figure 2 below, Ooka et al. teach the use of a coal bed as a source for methane to drive the gas turbine, the use of flue gas in combination with an oxidizer and a fuel prior to combustion, and the use of a coal bed as a storage region for flue gas. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the use of the coal bed taught in Ooka

because it is an economically viable and abundantly available source of methane and provides the ability to store the combustion products thereby reducing carbon dioxide emissions into the atmosphere. Furthermore, one of ordinary skill in the art at the time of the invention would have found it obvious to include the use of flue gas with the fuel/oxidizer mixture prior to combustion, as taught by Ooka, in order to raise the temperature of the reactants prior to combustion in order to increase the efficiency of the power plant.

10. Further regarding claim 1, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the conventional combined cycle power plant as disclosed by Viteri et al. (figure 1) where the oxidizer used in the combustion process is air and the reduced emissions combined cycle power plant disclosed by Ooka where the oxidizer used in the combustion process is oxygen in order to provide a secondary system as a back up measure to accommodate events such as peak loading of the power plant, transient states (start up/shut down), and schedule maintenance or failure. The combination of the combined cycle power plant as disclosed by Viteri et al. and the reduced emissions combined cycle power plant disclosed by Ooka et al. does not lend itself to be patentably distinguishable because one of ordinary skill in the art at the time of the invention would have found the combination of the two previously known power plants above to yield predictable results.



*Fig. 1*  
(Prior Art)

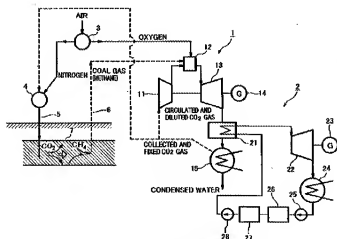


FIG. 2

11. Regarding claim 2, Viteri et al., as previously modified by Ooka et al, teach the use of an oxygen generator (3) to supply oxygen to a combustor.

12. Regarding claims 3 and 4, referring to figure 1 above, Viteri et al., as previously modified by Ooka et al., disclose the use of flue gas predominantly composed of carbon dioxide supplied to the compressor (11), as indicated by the dashed arrow at

compressor (11), and then to the combustor (12). The remainder of the carbon dioxide is sent to the gas compression module (4) and then to the coal bed for storage.

13. Regarding claim 5, Ooka et al. is relied upon to teach the liquefying of carbon dioxide for storage so that it may be released over a larger period of time (page 2 paragraph 3).

14. Regarding claims 6 and 7, referring to figure 2 above, Viteri et al., as previously modified by Ooka et al., teach the use of the same coal bed seam for storage and for extraction of methane, as illustrated.

15. Regarding claim 8, Ooka et al. is relied upon to teach the use of a gas feed piping (5) to move the carbon dioxide to the coal bed.

16. Regarding claim 9, Viteri et al., as previously modified by Ooka et al., disclose the use of an exhaust gas condenser (15) which collects the exhaust water and separates the carbon dioxide (page 8 paragraph 3).

17. Regarding claim 10, referring to figure 2 above, Viteri et al., as previously modified by Ooka et al., disclose a compressor (11) which compresses a portion of the uncondensed carbon dioxide leaving exhaust gas condenser (15), as indicated by the dashed arrow at compressor (11), and then supplying the carbon dioxide to the combustor (12).

18. Regarding claim 11, Viteri et al., as previously modified by Ooka et al., disclose the use of a compression module (4) to compress a portion of the carbon dioxide leaving the exhaust gas condenser (15) in order to liquefy the carbon dioxide for storage in the coal bed.



19. Regarding claim 13, as best understood, referring to paragraphs 9 and 10 above, Viteri et al., as previously modified by Ooka et al., disclose all elements. Regarding the means for supplying the feed materials, Viteri et al., as previously modified by Ooka et al., inherently disclose a means for supplying the feed materials to the combustor because it is necessary to provide a means to transport the feed materials to the combustor from their various locations. Similarly the means for supplying the flue gas stream is inherently disclosed because it is necessary to include a means for transporting the flue gas stream from the exhaust gas condenser to the combustor. With regards to the means for supplying the flue gas stream to a storage region, Viteri et al., as previously modified by Ooka et al., disclose a piping (5) capable of transporting the carbon dioxide from the gas compression module to the coal bed.

20. Regarding claim 14, Viteri et al., as previously modified by Ooka et al., disclose a gas compression module (4) which condenses the carbon dioxide from a gaseous phase to a liquid phase.

21. Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Viteri et al. USPN .6,622,470 B2 in view of Ooka et al. CA 2,465,384 in further view of Golomb et al. USPN 5,724,805.

22. Regarding claim 12, Viteri et al., as previously modified by Ooka et al., disclose all elements except for the step of supplying air from the air compressor to produce oxygen. Golomb et al. teach the use of "a compressor arranged to pressurize the air prior to separation of oxygen..." (column 2 lines 62-63). One of ordinary skill in the art at the time of the invention would have found it obvious to include the step of supplying air

from the air compressor in order to increase the amount of air being separated in the oxygen generator thereby increasing the amount of oxygen available for combustion in the power plant and increasing the efficiency of the power plant.

23. Regarding claim 15, as best understood, Viteri et al., as previously modified by Ooka et al. and Golomb et al., disclose all elements. Regarding the means for supplying air from the air compressor to the air separation plant, Golomb et al. inherently discloses a means for supplying the air because it is necessary to provide a means for transporting the compressed air from the air compressor to the oxygen generator.

24. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooka et al. CA 2,465,384 in view of Golomb et al. USPN 5,724,805.

25. Regarding claim 16, Ooka et al. discloses all elements except for the step of supplying compressed air from an air compressor to an oxygen plant. Golomb et al. teach the use of "a compressor arranged to pressurize the air prior to separation of oxygen..." (column 2 lines 62-63). One of ordinary skill in the art at the time of the invention would have found it obvious to include the step of supplying air from the air compressor in order to increase the efficiency of the power plant.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD L. SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Isabella can be reached on (571) 272-4749. The fax phone

Art Unit: 3725

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dmitry Suhol/  
Primary Examiner, Art Unit 3725

Gerald Sung  
Patent Examiner  
GS  
1/31/2008